Welch Allyn®

Service Manual
CL 300 Surgical Illuminator
SolarTec Source 270
CL 100 Surgical Illuminator
SolarTec Source 100

Welch Allyn Lighting Products
4619 Jordan Road
Skaneateles Falls, NY 13153-0187

PN: LB-MAN-CLSERV Rev. A

Table of Contents

General Information ---- 1-1
Technical Help Information ---- 1-1

Service Centers ---- 1-2

Warranty ---- 1-3

System Symbol Descriptions ---- 1-4

Warnings and Precautions ---- 1-5
Warning ---- 1-5
Caution ---- 1-5

Operating Instructions ---- 1-6
Controls ---- 1-6
Power On/Off Switch ---- 1-6
Fiber Port ---- 1-6
Multi Link™ Expansion Port - Installation and Use (optional) ---- 1-7
Light Attenuation Control ---- 1-7
Lamp Life Indicator ---- 1-7
Principles Of Operation ---- 1-8
Light Source ---- 1-8
Replacement Lamps ---- 1-8
Power Supply with Control Electronics ---- 1-8
Multi Link™ Port and Multi Link™ Expansion Port ---- 1-8

Service ---- 1-9
Cleaning ---- 1-9
Surgical Illuminator ---- 1-9
Multi Link™ Expansion Port ---- 1-9

Tools Required ---- 1-10

Troubleshooting ---- 1-11
CL 100 Surgical Illuminator ---- 1-11
CL 100 Surgical Illuminator Disassembly ---- 1-12
Test #1: Blown Fuses ---- 1-12
Test #2: 100 WATT Power Supply ---- 1-13
Test #3: Cooling Fan ---- 1-13
Test #4: LED/Overtemp Switch ---- 1-13

Test #5: Micro Link® Fiber Test ---- 1-13
Test #6: Power Supply Calibration ---- 1-14

CL 100 Surgical Illuminator Disassembly ---- 1-15
Power Supply Removal ---- 1-15
Platform Removal ---- 1-16
Front Bezel Removal ---- 1-16
Fan Deflector Removal ---- 1-16
Chassis Fan Removal ---- 1-17
LED/Overtemp Harness Removal ---- 1-17
Lamp Cable Removal ---- 1-17
Interlock Switch Removal ---- 1-18
Power Entry Module Removal ---- 1-18
CL 100 Surgical Illuminator Repair Parts List ---- 1-19
CL 300 Surgical Illuminator ---- 1-25

CL 300 Surgical Illuminator Disassembly ---- 1-27
Test #1: Blown Fuses ---- 1-27
Test #2: Auxiliary Board Input Terminals ---- 1-27
Test #3: Cooling Fan ---- 1-27
Test #4: LED Operation ---- 1-27
Test #5: Micro Link® Fiber Test ---- 1-28

CL 300 Surgical Illuminator Disassembly ---- 1-29
Internal Module Removal ---- 1-29
Power Supply Removal ---- 1-29
PCBA (part no. A4-10670) Removal ---- 1-30
Ignitor Removal ---- 1-31
Line Filter Removal ---- 1-31
Chassis Fan Removal ---- 1-32
Power Entry Module Removal ---- 1-33
Platform Removal ---- 1-34
Front Bezel Removal ---- 1-34
Blower Fan Removal ---- 1-34
Lamp Cable Removal ---- 1-35
CL 300 Surgical Illuminator Repair Parts List ---- 1-36

GLOSSARY OF TERMS ---------- 1-42

FINAL INSPECTION ---------- 1-43
CL 100 SURGICAL ILLUMINATOR ---------- 1-43
CL 300 SURGICAL ILLUMINATOR ---------- 1-43

SPECIFICATIONS ---------- 1-45

THEORY OF OPERATION ---------- 1-46
LIGHT SOURCE ---------- 1-46
REPLACEMENT LAMPS ---------- 1-46
POWER SUPPLY WITH CONTROL ELECTRONICS ---------- 1-46
MULTI LINK™ PORT AND MULTI LINK™ EXPANSION PORT ---------- 1-46

CL 100 SURGICAL ILLUMINATOR CIRCUIT DIAGRAM ---------- 1-47

CL 300 SURGICAL ILLUMINATOR CIRCUIT DIAGRAM ---------- 1-48

General Information

The Welch Allyn CL 100 Surgical Illuminator and the Welch Allyn CL 300 Surgical Illuminator provide brilliant illumination for the physician and surgeon. The lamps produce high intensity light nearly identical to the spectrum of sunlight. Special features include the ability to use either a Cogent Optics Micro Link® Fiber or a conventional fiber bundle.

Technical Help Information

Only fully trained and properly equipped personnel should perform all service and repairs, using genuine replacement parts and correct procedures. Failure to do so will invalidate the product warranty and could compromise instrument safety and performance.

Read and understand all safety warnings and service notes printed in this Service Manual and the Operating Manuals, part number LB-MAN-100W270W. If there is any doubt about any precaution or procedure, for phone help, or to order additional copies of the Operating Manual, contact:

Customer Service
Welch Allyn, Inc.
4619 Jordan Road, PO Box 187
Skaneateles Falls, NY 13153-0187 USA
Telephone: 1-315-685-2993 or
1-866-801-8428
FAX: 1-315-685-2999

Techncial Assistance
Telephone: 1-315-685-4233, 7:00am-3:00pm(EST)

When calling, refer to the model number shown on the data label, found on the back of your Surgical Illuminator.

Technical assistance is contained in "Troubleshooting" on page 11 of this manual.

Welch Allyn®

SERVICE CENTERS

If you have an equipment problem that you cannot resolve, you may call the Welch Allyn Service Center nearest you for assistance. Technical service support is available by telephone on normal business days at the phone numbers listed below. If you are advised to return a product to Welch Allyn for repair or routine maintenance, schedule the repair with the service center nearest you.

BEFORE RETURNING A PRODUCT FOR REPAIR YOU MUST OBTAIN AUTHORIZATION FROM WELCH ALLYN. AN RMA (RETURN MERCHANDISE AUTHORIZATION) NUMBER WILL BE GIVEN TO YOU BY OUR SERVICE PERSONNEL. BE SURE TO NOTE THIS NUMBER ON THE OUTSIDE OF YOUR SHIPPING BOX. RETURNS WITHOUT AN RMA NUMBER WILL NOT BE ACCEPTED FOR DELIVERY.

USA CUSTOMERS

Welch Allyn, Inc., U.S.A.
4619 Jordan Road
Skaneateles Falls, NY 13153-0187
Tel: 1-315-685-2993
Fax: 315-685-2999

CANADA CUSTOMERS

Welch Allyn, Ltd., Canada
160 Matheson Blvd. E., Unit #2
Mississauga, Canada L4Z 1V4
Tel: 905-890-0004
Fax: 905-890-0008

INTERNATIONAL CUSTOMERS

Welch Allyn, GmbH
Zollerstrasse 2-4
72417 Jungingen, Germany,
Tel: 011-49-7477-9271-73
Fax: 011-49-7477-9271-93

Welch Allyn, Ltd., Australia
Metro Center
Unit 5 38 South Street
Rydalmere, NSW 2116, Australia
Tel: 011-61-294-183-155
Fax: 011-61-294-183-650

Welch Allyn, Japan
Bon Marusan 8F, 3-5-1 Kanda
Jinbo-Cho, Chiyoda-Ku
Tokyo 101-0051
Japan
Tel: 011-813-5212-7391
Fax: 011-813-3261-7372

Welch Allyn, Ltd., Singapore
300 Beach Road, #25-08
The Concourse
Singapore 199589
Tel: 011-65-291-0882
Fax: 011-65-291-5780

Welch Allyn, China
Room 708, 227 Huang Pi Road, North
Central Plaza
Shanghai 200003
P.R. China
Tel: 011-86-21-63279631
Fax: 011-86-21-63279632

LATIN AMERICAN CUSTOMERS

MD International
11300 N.W. 41st Street
Miami, FL 33178 USA
Tel: 1-305-669-9003
Fax: 1-305-669-1971

WARRANTY

Welch Allyn warrants the CL 300 or CL 100 Surgical Illuminator when new, to be free of defects in material and workmanship and to perform in accordance with manufacturer's specifications when subject to normal use and service for a period of one year from date of purchase from Welch Allyn or an authorized agent. Welch Allyn will either repair or replace any components found to be defective or at variance from manufacturer's specifications within this time at no cost to the customer. It shall be the purchaser's responsibility to return the instrument to the authorized distributor, agent, or service representative.

Welch Allyn warrants the lamp to be free of defects in materials and workmanship for a period of 6 months from the date of purchase. This warranty does not cover the lamp for breakage or failure due to tampering, misuse, neglect, accidents, improper installation, modification, shipping, or from improper maintenance, service, or cleaning procedures.

This warranty is void if the instrument is not used in accordance with manufacturer's recommendations or if required service is performed by other than Welch Allyn or an authorized agent. Purchase date determines warranty requirements. No other express or implied warranty is given.

Welch Allyn®

System Symbol Descriptions

Attention: Read Operating Manual for Warnings, Precautions, and Instructions for Use

Caution – Hot Surface Area

5A, 250V

Replace Fuse as Marked
250V, 5A

WARNING – High voltage is present

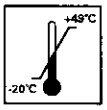
Symbol on power switch indicates power is off when pressed

~

Symbol in electrical rating signifies AC mains power

High Intensity Light

Protective Earth Ground



Storage Temperature Range

Maximum Storage Humidity

Type BF equipment, Class I

IPXØ

Not protected against the ingress of water

Manufactured in accordance with the relevant regulations and technical requirements of Japan.

WARNINGS AND PRECAUTIONS

WARNING

- Keep out of reach of patient.
- Not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- Disconnect from the patient before the discharge of a cardiac defibrillator.
- ELECTRICAL SHOCK HAZARD. Do not remove the top cover.
- Routinely examine the power cord and plug. Do not use if inspection reveals damage. Replace only with approved hospital grade power cord and plug with appropriate electrical rating.
- Do not place the exposed distal end of the Micro Link® Fiber or fiber bundle attached to either a headlight or other accessory. Failure to observe these precautions may result in burns to skin, clothing, or other material inadvertently placed in front of the Micro Link® Fiber or fiber bundle.
- High energy radiated light guided through endoscopes may give rise to high temperatures in front of the light outlet and to the tip of the instrument.
- Use care not to point the distal end of the fiber or headlight directly at the eye when unit is operating. The brilliant light output from the unit can cause eye injury per RP-27.1 (1994-1995 Threshold Limit Values for Chemical Substances and Physical Agent and Biological Exposure Indices, Final draft March 3,1995).
- Applied parts attached to this equipment should be approved 1) to the Medical Device Directive (93/42/EEC) (Europe), 2) approved by a Nationally Recognized Testing Laboratory (United States), and 3) by a Standards Council of Canada accredited laboratory (Canada) to the appropriate medical standards. The use of non-approved components may compromise safety.
- During life threatening procedures, it is recommended to have a backup Light source and an additional replacement lamp.
- The light source lamps are highly pressurized, any damage or improper handling may cause premature failure or explosion of the lamp.
- The light source lamps are hot immediately after use, allow the lamp to cool for five (5) minutes after operation. Temperatures peak in the light Sources approximately 60 seconds after the Light Source is powered off.

CAUTION

- Do not place anything on top of the Light Source. Do not store liquid above the Light Source.
- Clogged or blocked vents may cause Light Source overheating and will result in thermal shutdown. Keep the Light Source clear of any obstructions.
- Fully close the attenuator before turning on the Light Source or when operational but not in use.

OPERATING INSTRUCTIONS

CONTROLS

POWER ON/OFF SWITCH

Plug hospital grade Power Cord into a grounded "Hospital Grade" or "Hospital Use" receptacle to ensure grounding reliability.

Press Main Power Switch **ON** (**I** pressed in).

The lamp will continue to operate until the power switch is moved to the **OFF** position (**O** pressed in). If the lamp cannot be started or stops operating see Section 8: Troubleshooting.

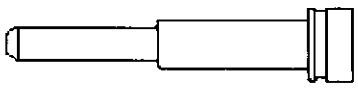
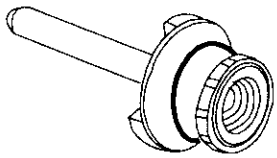
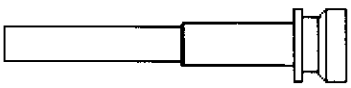
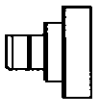
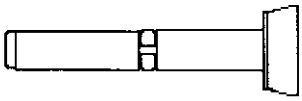
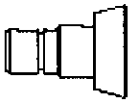
NOTE:

- It is normal to hear clicking (10 pulses or less) before the lamp is started.
- To insure proper operation, wait thirty (30) seconds between on/off cycles.

FIBER PORT

To increase the versatility and applicability of use, the Light Sources are designed to use either a Micro Link® Fiber or a fiber bundle via the Multi Link™ Port and Multi Link™ Expansion Port.

Cable Compatibility Table

Multi Link™ Port	Multi Link™ Expansion Port
Micro Link® Fiber 	
Karl Storz 	ACMI 
Olympus 	Wolf, Dyonics 

For cables with no Multi Link™ Expansion Port required:

1. Close the light attenuator or turn the Light Source off.

2. Connect the instrument end of the Micro Link® Fiber or fiber bundle to the instrument.
3. Insert, until fully engaged (snap sound), the Light Source end into the Multi Link™ Port.
4. Turn on Light Source. Adjust the light attenuator to the required illumination level.

MULTI LINK™ EXPANSION PORT - INSTALLATION AND USE (OPTIONAL)

CAUTION: The Multi Link™ Expansion Port contains optical elements that can become damaged if dropped or abused.

NOTE: The Multi Link™ Expansion Port must be fully engaged into the Light Source before inserting Fiber Bundle.

To use the Multi Link™ Expansion Port perform the following operations:

1. Close the light attenuator or turn the Light Source off.
2. Remove, if any, Micro Link® Fiber or fiber bundle from the Multi Link™ Port.
3. Insert the Multi Link™ Expansion Port, press and turn clockwise until it locks into place.
4. Connect the fiber bundle to the instrument.
5. Insert, until fully engaged, the Light Source end of the fiber bundle into the Multi Link™ Expansion Port.
6. Turn on Light Source. Adjust the light attenuator to the required illumination level.

To remove the Multi Link™ Expansion Port perform the following operations:

1. Turn the Light Source off.
2. Remove the fiber bundle.
3. Turn Multi Link™ Expansion Port counter-clockwise until unlocked and remove.

LIGHT ATTENUATION CONTROL

Moving the illumination wheel up **+** increases light output. Moving the wheel down **—** reduces light output.

LAMP LIFE INDICATOR

A yellow indicator light located on the console will light when there is approximately 50 hours remaining on the lamp. A new Replacement Lamp should be available at this point. Once the remaining hours have been exhausted the lamp will turn off.

PRINCIPLES OF OPERATION

LIGHT SOURCE

The Surgical Illuminators consist of an enclosure housing a high intensity lamp, proprietary optical platform, user controls and indicators, and a power supply with control electronics. Cooling is provided via internal fans. In the event that the fan(s) malfunctions or if adequate air flow is blocked and/or the internal temperature of the device exceeds the engineering specifications, an internal thermal protection mechanism will automatically shut off power to the lamp. After cooling, the Light Sources may be restarted.

REPLACEMENT LAMPS

The lamps are high pressure, high intensity and long life Light Sources. They are mounted into a patented lamp fixture which is designed to allow both easy and rapid exchange in the field as well as ensuring precise alignment to the optical platform.

POWER SUPPLY WITH CONTROL ELECTRONICS

All the electricity to the Light Source is controlled through the ON/OFF switch. Power to energize and operate the lamp, fans, and control circuitry is provided by a custom designed, wattage regulated, switching power supply. The operational life of the lamp and lamp life indicator are controlled by a lamp voltage monitoring circuit.

MULTI LINK™ PORT AND MULTI LINK™ EXPANSION PORT

Internal, to both the Multi Link™ Port and Multi Link™ Expansion Port, are patented coupling optics and mechanics designed to produce the highest output powers. Internal to the Light Sources are fans and heatsinks designed to reduce temperatures at the optical coupling joints thereby minimizing the possibility of damage to Micro Link® Fiber and fiber bundles.

SERVICE

CLEANING

1. Prior to cleaning, turn the power switch OFF, and disconnect power source from both the Light Source and the wall outlet.

2. Clean the external surfaces by wiping with a cloth dampened with 10% bleach solution. DO NOT IMMERSE.

   - Routinely inspect and clean all air intakes / out flows at the rear of the chassis for lint or other debris.

   - Follow the manufacturer's instructions when Cleaning the fiber bundles or accessories used with the light source.

3. Wipe the power cord with a cloth dampened with 10% bleach solution and water. DO NOT IMMERSE. DO NOT RECONNECT WET.

4. DO NOT wipe down any lenses or windows.

5. DO NOT plug the power source into a wall outlet until it is thoroughly dry.

SURGICAL ILLUMINATOR

The console may be cleaned using a clean soft cloth with the following cleaning agents:

Enzymatic Solution (Enzol)
Isopropyl Alcohol
Hydrogen Peroxide 3% USP
2% Glutaraldehyde Solution
Soap and Water
10% bleach solution and water

CAUTION: Do not splash cleaning agents into any openings, seams or electrical components.

MULTI LINK™ EXPANSION PORT

The outside surfaces may be cleaned with a soft cloth using the following:

Isopropyl Alcohol
Soap and Water

The glass surfaces may be cleaned by the following methods:

A cotton swab moistened with Isopropyl Alcohol
Blow with dry compressed air

NOTE: Use care in cleaning the optical surfaces of the Multi Link™ Expansion Port to prevent scratches.

TOOLS REQUIRED

- Slotted screwdriver, less than 6" long
- #1 Phillips Screwdriver, less than 6" long
- #2 Phillips Screwdriver, less than 6" long
- Open end wrench set - English or 5/16"
- Needle nose pliers
- Nut Driver Set - English or 3/16", 1/4", 5/16"
- Nut Driver Set - Metric or 10mm
- Deep well socket set and wrench (2) - CL 100 Surgical Illuminator
- Non-conductive pot adjusting tool - CL 100 Surgical Illuminator
- Light output power meter with head. Coherent Lasermate 1D or equivalent (meter), Head Model 1d10 - CL 100 Surgical Illuminator
- Light output meter - Labsphere Model FIMS-400P or equivalent that measures in lumens - CL 300 Surgical Illuminator
- Calibrated RMS Digital Multimeter (DMM)

TROUBLESHOOTING

CL 100 SURGICAL ILLUMINATOR

Symptom	Cause	Remedy
Lamp fails to start and fans are not running.	No power to unit	Check power supply cord and outlet
	Line voltage is <90 VAC	Refer to Hospital Engineering department
	Fuses blown	Inspect, replace and retest. Go to "Test #1: Blown Fuses" on page 12.
	Safety interlock open	Check and tighten slotted screw on lamp fixture access door
	Power supply failure	Go to "Test #2: 100 WATT Power Supply" on page 13
Lamp fails to start and fans are running.	Lamp not in light source (audible clicking heard)	Install a 100W replacement lamp, model 90133.
	Defective lamp cable (discolored, bent or broken prongs) (audible clicking heard)	Replace and retest lamp cable.
	Defective power supply (discolored, bent or broken prongs) (no audible clicking heard)	Inspect wiring and if it is fine, replace and retest power supply.
Lamp shuts off after operating for a few minutes and restarts after cooling.	Inadequate air flow for cooling, Light Source over temperature	Allow 2" (51mm) clearance at back of unit; insure that air intake-outflow vents are clean and not blocked. Allow unit to cool and then restart
	Fan failure	Go to "Test #3: Cooling Fan" on page 13.
	Illuminator is overheating not due to clearance.	Verify operation of fans. Clean fans and internal components of dust.
	Lamp is at the end of life, but amber LED is inoperative.	Verify LED flickers on when it is first turned on. If not, go to "Test #4: LED/Overtemp Switch" on page 13.
Indicator light on and lamp shuts off	Lamp life exceeded.	Install a 100W replacement lamp, model 90133.
	Lamp cable defective.	Replace if prongs are discolored, broken, or bent.
	Power supply out of calibration.	To go "Test #6: Power Supply Calibration" on page 14.
Replacement Lamp will not seat into Light Source	Lamp is not oriented correctly	Rotate lamp 180° and re-insert
	Incorrect Replacement Lamp	Install a 100W replacement lamp, model 90133.

Symptom	Cause	Remedy
Low light output	Damaged Micro Link® Fiber or fiber bundle	Check ends of Micro Link® Fiber or fiber bundle for damage. Replace with new Micro Link® Fiber or fiber bundle. Go to "Test #5: Micro Link® Fiber Test" on page 13.
	Fiber bundle not connected correctly.	Re-insert fiber bundle correctly.
	Lamp near end of usable life	Install a 100W replacement lamp, model 90133.
	Filter assembly on platform contaminated.	Clean or replace filter assembly as necessary.
	Mirrors dirty.	Clean mirrors.
	Broken mirrors.	Replace platform.
	Misaligned mirrors (possible if unit suffers damage)	If above steps fail to improve output, replace and retest platform.
	Dirty or damaged internal module.	Inspect, clean, and replace if necessary.
Fiber bundle will not install in Light Source	Not a compatible fiber bundle	See "Operating Instructions" on page 6 Use compatible bundle design
	Install/Remove Multi Link™ Expansion Port	See "Operating Instructions" on page 6
	Multi Link™ Expansion Port installed	Remove Multi Link™ Expansion Port
Audible "clicking" or arcing sound during the lamp ignition process	No problem	Normal operation

CL 100 Surgical Illuminator Disassembly

NOTE: For all tests, remove 9 screws from top cover.

NOTE: Do not operate unit with the top cover removed for more than 5 minutes or the unit will overheat.

Test #1: Blown Fuses

The purpose of this test is to determine the source of a short circuit causing fuses to blow. Refer to the Block Diagram on page 47.

Replace and retest the fuses. If unit functions normally, inspect fuses that were blown. If solder is melting out of the end of the fuse and the glass is not blackened, remove and replace the power entry module. This fault occurs when the prong of the fuse holder makes poor contact with the fuse. The prong will look discolored and pitted where it contacts the fuse.

If the fuse blows again, inspect the power supply and the wiring for damaged or burnt components. Remove and replace any visually defective components.

If visual inspection does not yield any evidence of damage, remove and replace power supply and retest.

TEST #2: 100 WATT POWER SUPPLY

Verify operating voltage is present on power supply input terminals. Connect meter and set to volts AC to J1 and J2 terminals. When power is applied to the unit, verify the operating voltage is displayed on the meter. NOTE: Verify the lamp access door is closed.

If voltage is present, replace and retest power supply.

If voltage is not present, inspect the fuses, wiring, power entry module, line filter, and interlock switch.

TEST #3: COOLING FAN

The purpose of this test is to verify the operation of the lamp cooling fan.

Visually inspect for a broken fan. When the unit is powered up, look for a fan not turning. If found, remove top cover and inspect fan. Replace any broken fans.

If fan is inoperative and not broken, measure using DMM set for Volts DC for 12VDC on fan connector.

- If voltage is present, replace and retest fan.
- If voltage is not present, replace and retest power supply.

TEST #4: LED/OVERTEMP SWITCH

The purpose of this test is to verify proper operation of the LED.

Visually inspect that LED/overtemp switch harness is connected to the power supply. Verify continuity of wiring and LED with DMM set to the Diode Scale. DMM should read ≈ .7VDC.

- If the DMM reading does not match, replace and retest the LED harness.
- If DMM reading matches above, replace and retest the power supply.

TEST #5: MICRO LINK® FIBER TEST

The purpose of this test is to verify the operation of the Micro Link® Fiber.

With the illuminator on, connect the fiber and the headlight. Over a distance of at least five feet, adjust the spot diameter to the largest size.

- If the intensity of light is not consistent throughout the light spot and rotating the distal end connector does not cause the shape to change, the headlight is the most likely cause of the fault.
- If the intensity is not consistent with alternating light and dark rings present, the fiber is broken at the distal end.

Over the same distance, adjust the headlight to the smallest diameter spot. At this adjustment, the headlight is focused. If any spot irregularities are present, hold the headlight steady while rotating the distal end (black) connector.

- If the location of the defects move, remove the fiber, clean the end with distilled water, reconnect the unit, and test. Replace the fiber if defects are still present.

- If the location of the defects remain stationary, the fault is within the headlight.

TEST #6: POWER SUPPLY CALIBRATION

The purpose of this test is to verify the operation of the power supply.

Apply power to unit, once the lamp lights, connect the DMM (set to volts DC) to the lamp cable wires on the power supply. The positive lead of DMM to the HV+ terminal on the power supply and the negative lead of the DMM to the Lamp Return - terminal on the power supply. WARNING: Do not connect DMM to wires prior to turning the unit on. When the lamp ignites, there is approximately 25kV on the terminals which could damage the DMM. Monitor the voltage displayed on the fluke when the LED first turns on. Verify the voltage is between 17.00 and 18.00v.

- If the voltage is less than 17.00VDC, remove and replace the power supply or return the unit for recalibration.

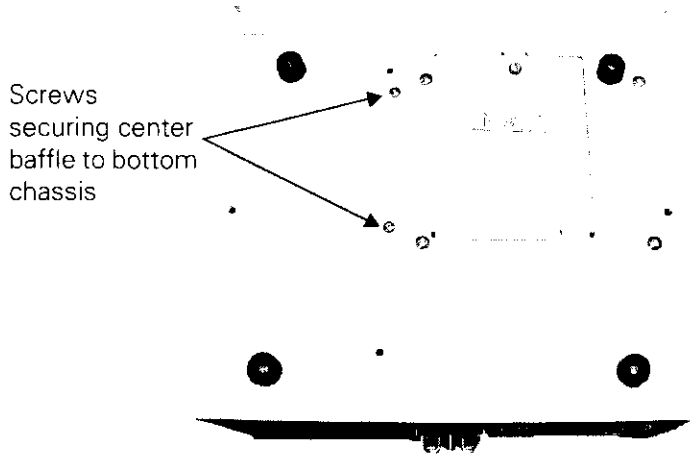
If the voltage is between 17.00VDC and 18VDC, remove and replace the lamp fixture.

- If the voltage is more than 18.00DC, contact the Welch Allyn Technical Services Department at 1-315-685-2993 or 1-315-685-4233, 7:00am-3:00pm(EST).

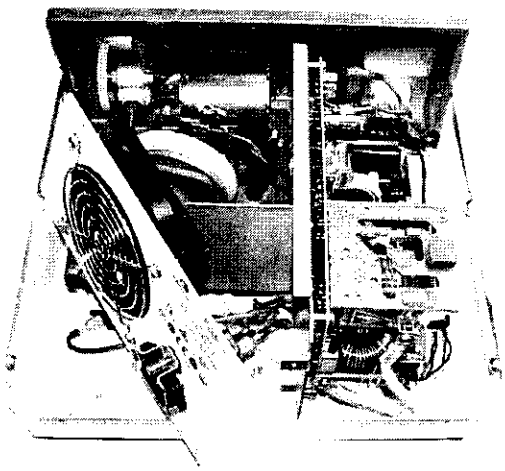
CL 100 Surgical Illuminator Disassembly

Power Supply Removal

1. Remove the 9 screws securing the top cover and remove the cover.
2. Remove the 3 screws from the bottom side of the back panel.
3. Disconnect wires from J1 and J2 on the power supply. Disconnect fan connector from J4.
4. Remove the 2 screws from the bottom chassis, securing the center baffle (see figure below).



5. Remove the nut that secures the center baffle to the back panel.
6. Pull back panel out and move to the platform side of the chassis to gain access to the back of the power supply.



7. Remove the two white lamp cable wires and disconnect the 4 wire connector. Remove the supply and baffle.

8. Remove the 4 screws from the corners of the power supply. Remove supply.

9. Reinstallation is the reverse process with the brown wire going to J1 and the blue wire going to J2. The longer of the two lamp cable wires attaches to the (+) lamp HV terminal and the shorter wire attaches to the (-) lamp return. Refer to "Photo 8" on page 24 to connect the HV+ and lamp return - terminals as shown.

PLATFORM REMOVAL

1. Remove 9 screws securing top cover and remove the cover. Remove the 5 screws securing the front bezel to the bottom chassis and pull front panel out from chassis. Remove the lamp from the platform.

2. Remove the 2 screws from the fan deflector assembly.

3. Remove the 4 screws from the corners of the platform.

4. As necessary, remove the 2 screws from the filter assembly.

5. Remove the platform. Reinstallation is the reverse process. Install the front bezel and check for proper movement of attenuator. Loosen platform screws and reposition as necessary.

FRONT BEZEL REMOVAL

1. Remove 9 screws securing top cover and remove the cover. Remove the 5 screws securing the front bezel to the bottom chassis and pull front panel out from chassis.

2. Remove wires from power switch noting wire locations. Push on switch from the inside to remove the switch from the bezel.

3. Using a sharp knife, remove the black RTV from the LED wires where it mounts to the front bezel. Once removed, apply acetone to the LED and the front bezel to weaken the glue bond and remove the LED from the front bezel.

4. Installation is the reverse process. To attach the LED, ensure both panel and LED surfaces are clean. Use superglue, loctite 430 to mount the LED. Use RTV sealant Dow Corning 737 to seal the LED, preventing any light from the illuminator passing through.

FAN DEFLECTOR REMOVAL

1. Remove 9 screws securing top cover and remove the cover.

2. Remove the 5 screws securing the front bezel to the bottom chassis and pull front panel out from chassis.

3. Remove the overtemp switch from the fan deflector.

4. Carefully remove the heat shrink tubing from the fan wiring harness.

5. Disconnect the connector and remove it from the power supply.

6. Installation is the reverse process with installing new heat shrink tubing over fan connector.

CHASSIS FAN REMOVAL

1. Remove 9 screws securing top cover and remove the cover. Remove 4 screws securing the fan to the back panel.

2. Remove heat shrink tubing from the fan connector. Disconnect and remove the wire ties from the harness at the platform mounts. Remove the fan.

3. Installation is the reverse process.

LED/OVERTEMP HARNESS REMOVAL

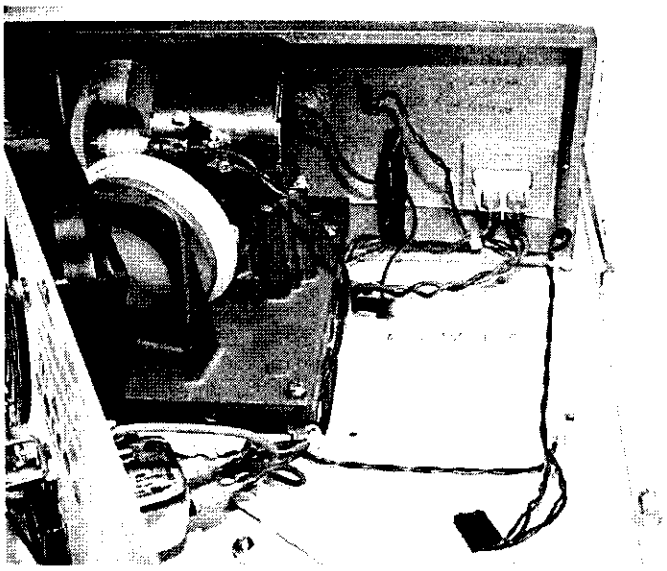
1. Remove 9 screws securing top cover and remove the cover. Remove the 5 screws securing the front bezel to the bottom chassis and pull front panel out from chassis.

2. Remove the overtemp switch from the fan deflector assembly. Remove the wire tie from the overtemp switch harness at the platform.

3. Using a sharp knife, remove the black RTV from the LED wires where it mounts to the front bezel. Once removed, apply acetone to the LED and the front bezel to weaken the glue bond and remove the LED from the front bezel.

4. Remove the 3 wire ties and remove the harness.

5. Installation is the reverse process. To attach the LED, ensure both the panel and the LED surfaces are clean. Use superglue (loctite 430) to mount the LED. Use RTV sealant (Dow Corning 737) to seal the LED preventing any light from the illuminator to pass through. See figure below for routing of wires.



LAMP CABLE REMOVAL

1. Remove 9 screws securing the top cover and remove the cover. Remove the 3 screws from the bottom of the back panel. Remove the nut securing center baffle to the back panel. Slide back panel to the side.

2. Remove the nut from the wire tie clamp securing the lamp cable to the bottom chassis. Remove the lamp cable from the power supply and remove the cable.

3. Installation is the reverse process with the longer cable wire going to the HV+ terminal on the power supply and connecting the shorter wire to the Lamp Return - terminal. View the unit from the rear and compare the HV+ and the Lamp Return - are connected as shown in "Photo 8" on page 24.

Interlock Switch Removal

1. Remove the 9 screws securing the top cover and remove the cover.

2. Disconnect the wires from the interlock switch.

3. Remove the two nuts from the interlock switch and remove.

4. Installation is the reverse process, connecting the wires to the terminals marked COM and NO.

Power Entry Module Removal

1. Remove 9 screws securing the top cover and remove the cover. Remove the 3 screws from the bottom of the back panel. Remove the nut securing center baffle to the back panel.

2. Remove the 4 screws securing the chassis fan. Remove the wires from PEM.

3. Remove the two nuts securing the PEM to the back panel. Remove the PEM.

4. Installation is the reverse process with the following requirements:

   - The star washer is located between the PEM flange and the painted surface side of the back panel.
   - The flat washer is installed on the other side of the panel and is secured with the nut.
   - Rotate the screw so that you can later install the power cord retainer.
   - The brown wire is connected to the terminal marked as P on the PEM. The blue wire is connected to the terminal marked as N on the PEM. The green wire from the back panel is connected to the ground terminal on the PEM.

CL 100 SURGICAL ILLUMINATOR REPAIR PARTS LIST

Part Number	Description	Photo #	Bubble #	Quantity
90133	100W REPLACEMENT LAMP			1
LB-MAN-100W270W	MANUAL, 100W/270W SOLARTEC			1
A0-10756	PANEL, BOTTOM, 270W	1	1	1
A0-10768	LABEL, WARNING, ILLUMINATORS	1	2	1
A0-10714	SCREW, PAINTED, XLS	1	3	12
101-0033	SCREW, #8-32 X 3/8, PHPS	1	4	4
101-0022	SCREW, #6-32 X 1/4, PHSS	1	5	2
016-0005	XLS, BUMPER, RUBBER, 5/8	1	6	4
101-0068	SEMS, #6-32 X 5/16 PHPS	1	7	8
A0-10683	COVER, TOP, XLS CHASSIS	2	8	1
A0-10727	KAPTON TAPE, TOP COVER, XLS	2	9	1
A0-10828	PANEL, FRONT, SOLARTEC 100W	3	10	1
U50087	100W INTERNAL MODULE ASSEMBLY	3	11	1
U50081	100W FAN DEFLECTOR ASSEMBLY	3	12	1
U50085	100W FILTER ASSEMBLY	3	13	1
U50075	100W ALIGNED PLATFORM	3	14	1
A0-10711	FAN, CHASSIS, XLS	3	15	1
A0-10856	PANEL, BACK WAVE PATTERN	3	16	1
213-0017	POWER ENTRY MODULE/LINE FILTER, FUSED	3	17	1
102-0012	KEPS, #6-32, W/CONICAL WASHER	3	18	4
A4-10650	WIRE HARNESS, ON/OFF, 100W	3	19	1
A4-10647	POWER SUPPLY, XLS	4	20	1
A0-10746	OVERTEMP/LED SWITCH ASSEMBLY	4	21	1
A0-10712	BAFFLE, CENTER, XLS	4	22	1
A0-10843	FOAM, IGNITOR	4	40	1
101-0062	SEMS, #6-32 X 9/16 PHPS	5	23	4
207-0007	GUARD, FAN, 92MM	5	24	1
105-0008	CORD, RETAINING CLAMP	5	25	1
106-0011	STANDOFF, #8, .75L	5	26	4
208-0016	FUSE, 5A SHEET III	6	27	2
A4-10465	WIRE, PEM TO DIN	6	28	1
101-0073	SCREW, #8-32 X 3/4", PHPS	6	29	4
010-0016	TUBING, HEAT SHRINK 3/4" BLACK	6	30	2.25"
101-0061	SCREW, #4-40X1/4, PHPS	6	31	4
101-0038	PLUG, 6/25	7	32	1

Part Number	Description	Photo #	Bubble #	Quantity
104-0006	WASHER, COLOR COATED	7	33	1
104-0008	WASHER, SERRATED	7	34	1
104-0007	WASHER, FLAT	7	35	1
102-0001	NUT, HEX	7	36	1
104-0019	WASHER, #4 EXTERNAL TOOTH	7	37	2
A0-10864	CABLE, LAMP, 30K	8	38	1
112-0001	CABLE TIE, SMALL 4"	8	39	8

PHOTO 1

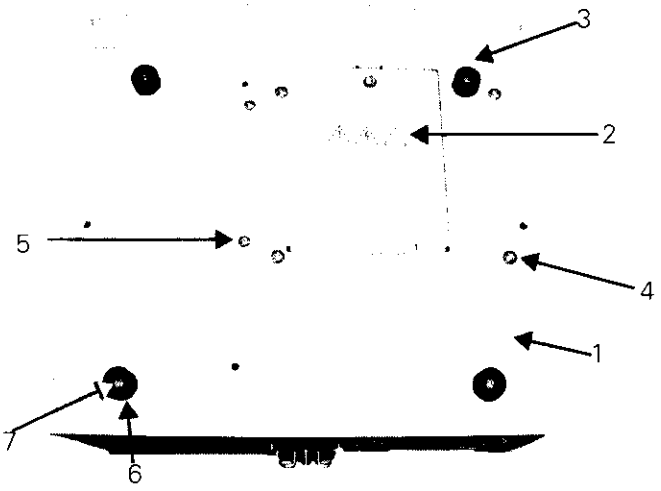


PHOTO 2

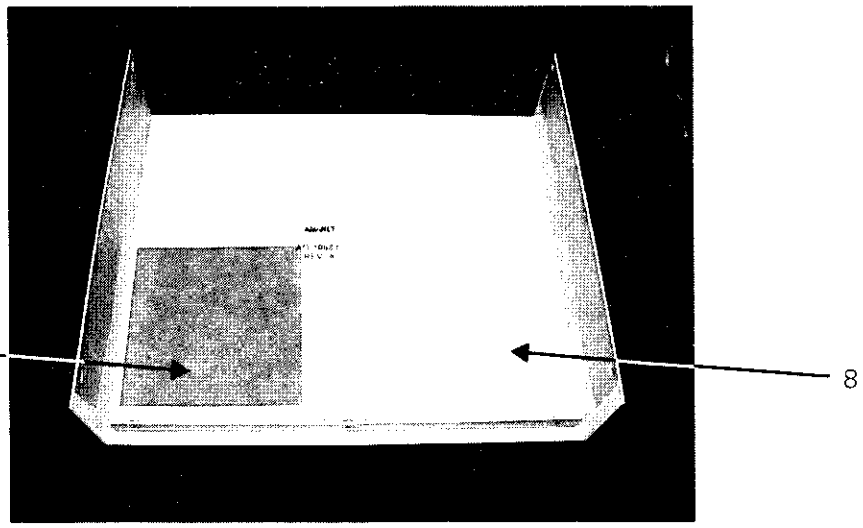


PHOTO 3

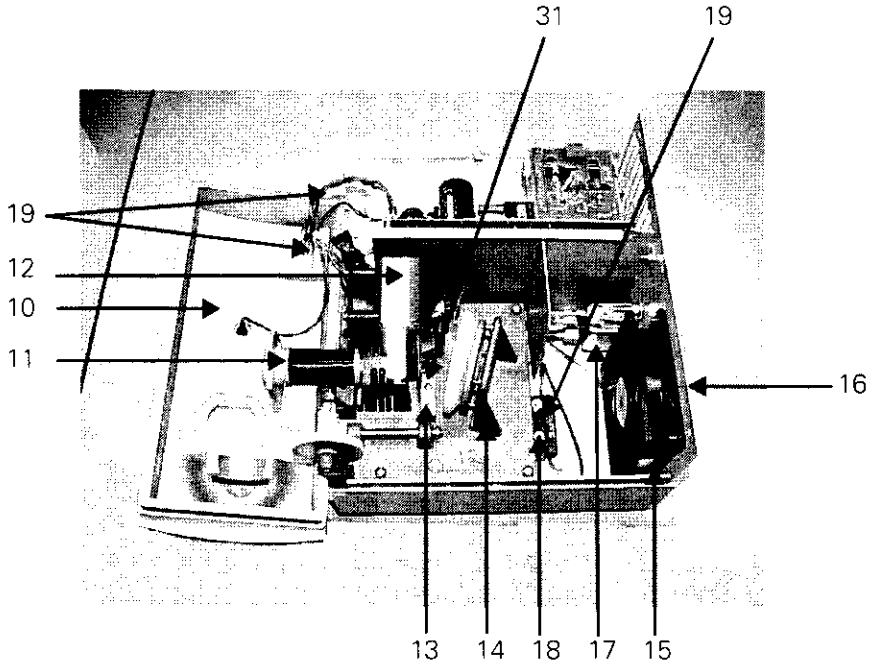


PHOTO 4

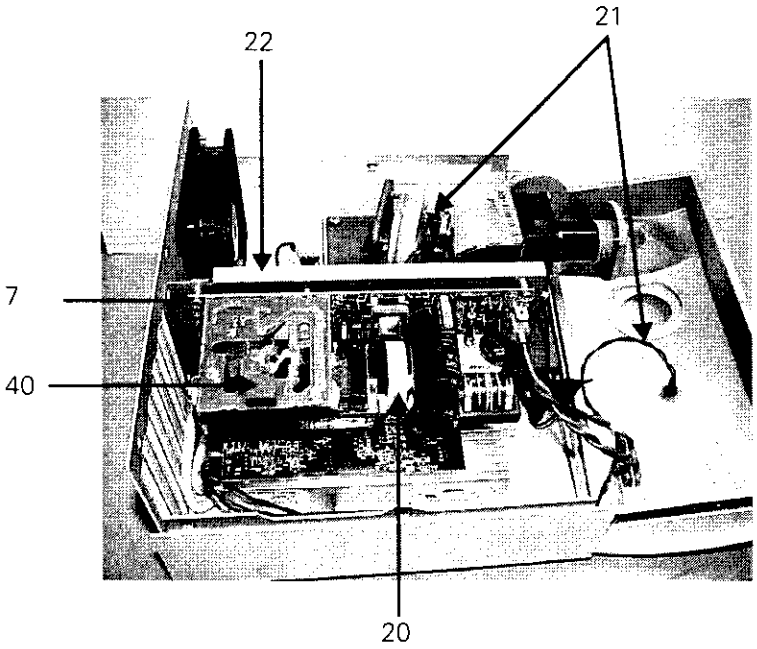


PHOTO 5

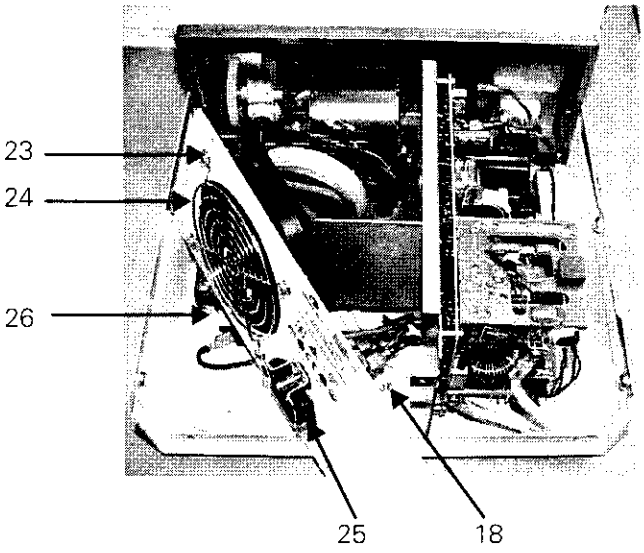


PHOTO 6

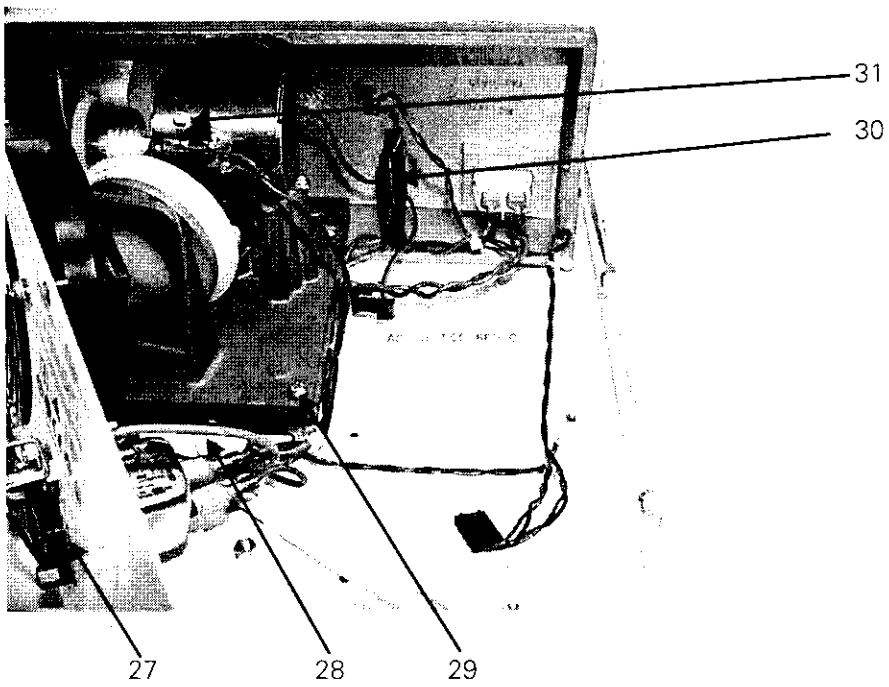


PHOTO 7

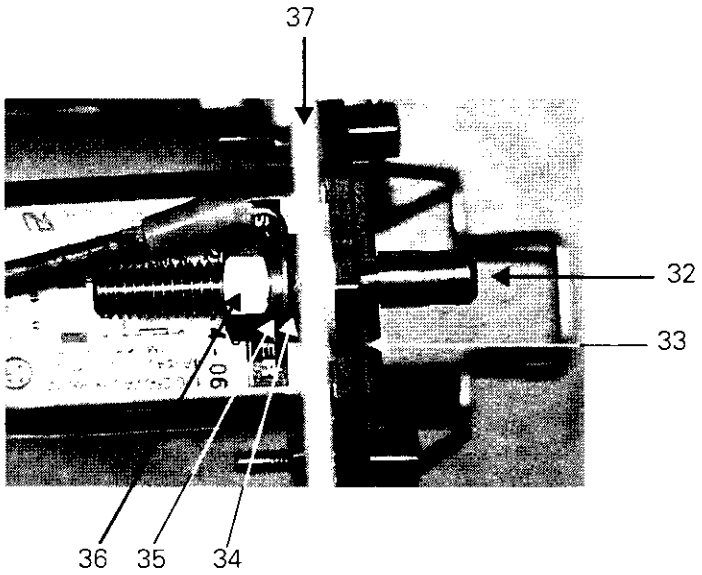
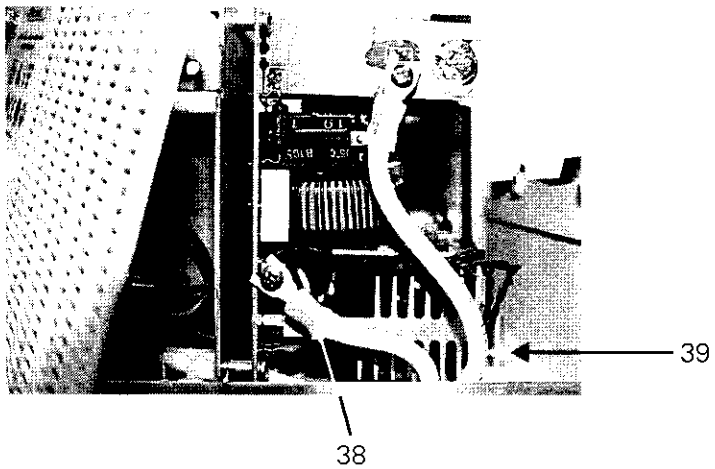


PHOTO 8



CL 300 SURGICAL ILLUMINATOR

Symptom	Cause	Remedy
Lamp fails to start and fans are not running.	No power to unit	Check power supply cord and outlet
	Line voltage is <90 VAC	Refer to Hospital Engineering department
	Fuses blown	Inspect, replace and retest. Go to "Test #1: Blown Fuses" on page 27.
	Safety interlock open	Check and tighten slotted screw on lamp fixture access door
	Power supply or auxiliary board failure	Go to "Test #2: Auxiliary Board Input Terminals" on page 27
Lamp fails to start and fans are running.	Lamp not in light source (audible clicking heard)	Install a 270W replacement lamp, model 90125.
	Defective lamp cable (discolored, bent or broken prongs) (audible clicking heard)	Replace and retest lamp cable.
	Defective power supply (discolored, bent or broken prongs) (no audible clicking heard)	Inspect wiring and if it is fine, replace and retest power supply.
Lamp shuts off after operating for a few minutes and restarts after cooling.	Inadequate air flow for cooling, Light Source over temperature	Allow 2" (51mm) clearance at back of unit; insure that air intake-outflow vents are clean and not blocked. Allow unit to cool and then restart
	Fan failure	Go to "Test #3: Cooling Fan" on page 27.
	Illuminator is overheating not due to clearance.	Verify operation of fans. Clean fans and internal components of dust.
	Lamp is at the end of life, but amber LED is inoperative.	Verify LED flickers on when it is first turned on. If not, go to "Test #4: LED Operation" on page 27.
Indicator light on and lamp shuts off	Lamp life exceeded.	Install a 270W replacement lamp, model 90125.
	Lamp cable defective.	Replace if prongs are discolored, broken, or bent.
Replacement Lamp will not seat into Light Source	Lamp is not oriented correctly	Rotate lamp 180° and re-insert
	Incorrect Replacement Lamp	Install a 270W replacement lamp, model 90125.

Symptom	Cause	Remedy
Low light output	Filter assembly on platform contaminated.	Clean or replace filters as necessary.
	Mirrors are dirty.	Clean the mirrors.
	Broken mirrors.	Replace platform.
	Misaligned mirrors (possible if unit suffers damage)	If above steps fail to improve output, replace and retest platform.
	Damaged Micro Link® Fiber or fiber bundle	Check ends of Micro Link® Fiber or fiber bundle for damage. Replace with new Micro Link® Fiber or fiber bundle. Go to "Test #5: Micro Link® Fiber Test" on page 28.
	Fiber bundle not connected correctly.	Re-insert fiber bundle correctly.
	Lamp near end of usable life	Install a 270W replacement lamp, model 90125.
Fiber bundle will not install in Light Source	Not a compatible fiber bundle	See "Operating Instructions" on page 6 Use compatible bundle design
	Install/Remove Multi Link™ Expansion Port	See "Operating Instructions" on page 6
	Multi Link™ Expansion Port	Remove Multi Link™ Expansion Port
Audible "clicking" or arcing sound during the lamp ignition process	No problem	Normal operation

CL 300 Surgical Illuminator Disassembly

NOTE: For all tests, remove 9 screws from top cover.

NOTE: Do not operate unit with the top cover removed for more than 5 minutes or the unit will overheat.

Test #1: Blown Fuses

The purpose of this test is to determine the source of a short circuit causing fuses to blow. Refer to the Block Diagram on page 48.

Replace and retest the fuses. If unit functions normally, inspect fuses that were blown. If solder is melting out of the end of the fuse and the glass is not blackened, remove and replace the power entry module. This fault occurs when the prong of the fuse holder makes poor contact with the fuse. The prong will look discolored and pitted where it contacts the fuse.

If visual inspection does not yield any evidence of damage, remove J2 and J3 from auxiliary board (blue and brown wires that connect PCBA auxiliary board to the power supply. Replace fuses and turn system on. Remove power and inspect fuses.

- If the fuses are blown, remove and replace the PCBA auxiliary board (part no. A4-10670).
- If fuses are fine, remove and replace the power supply.

Test #2: Auxiliary Board Input Terminals

Verify operating voltage is present on auxiliary board input terminals. Connect meter and set to volts AC to J1 and J4 terminals. When power is applied to the unit the operating voltage, verify it is displayed on the meter. NOTE: Verify the lamp access door is closed.

If voltage is present, replace and retest auxiliary board.

If voltage is not present, inspect the fuses, wiring, power entry module, line filter, and interlock switch.

NOTE: If lamp is not on and voltage is present, check if the power supply is defective.

Test #3: Cooling Fan

The purpose of this test is to verify the operation of the lamp cooling fan.

Visually inspect for a broken fan. When the unit is powered up, look for a fan not turning. If found, remove top cover and inspect fan. Replace any broken fans.

If fan is inoperative and not broken, measure using DMM set for Volts DC for 12VDC on fan connectors, J11 is for the lamp fan (exhaust) and J10 for the power supply (intake).

- If voltage is present, replace and retest fan.
- If voltage is not present, replace and re-test auxiliary board.

Test #4: LED Operation

The purpose of this test is to verify proper operation of the LED.

Visually inspect that J1 is connected to the auxiliary board. Verify continuity of wiring and LED with DMM set to the Diode Scale. DMM should read ≈ .7VDC.

- If the DMM reading does not match, replace and retest the LED harness.
- If DMM reading matches above, replace and retest the auxiliary board.

TEST #5: MICRO LINK® FIBER TEST

The purpose of this test is to verify the operation of the Micro Link® Fiber.

With the illuminator on, connect the fiber and the headlight. Over a distance of at least five feet, adjust the spot diameter to the largest size.

- If the intensity of light is not consistent throughout the light spot and rotating the distal end connector does not cause the shape to change, the headlight is the most likely cause of the fault.
- If the intensity is not consistent with alternating light and dark rings are present, the broken fiber is broken at the distal end.

Over the same distance, adjust the headlight to the smallest diameter spot. At this adjustment, the headlight is focused. If any spot irregularities are present, hold the headlight steady while rotating the distal end (black) connector.

- If the location of the defects move, remove the fiber, clean the end with distilled water, reconnect the unit, and test. Replace the fiber if defects are still present.
- If the location of the defects remain stationary, the fault is within the headlight.

CL 300 Surgical Illuminator Disassembly

NOTE: All servicing requires removal of the top cover. Remove the 9 screws and remove the cover.

Internal Module Removal

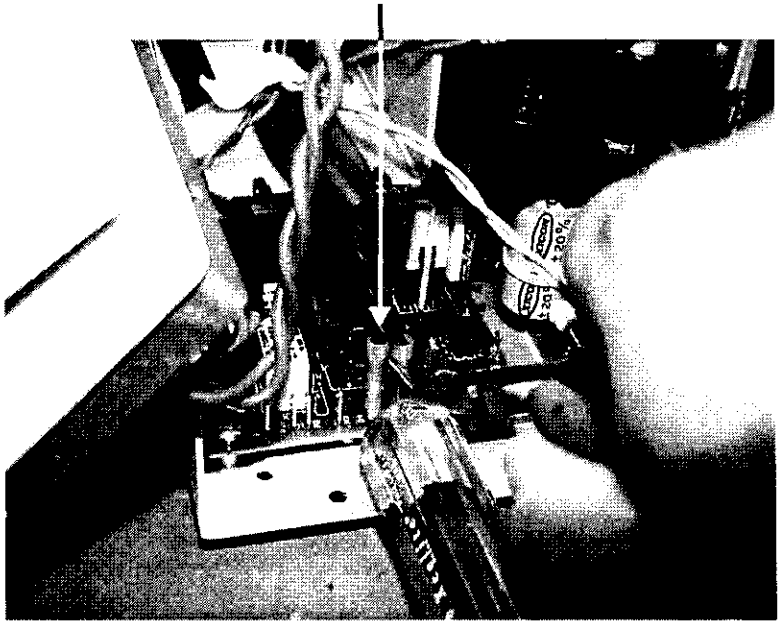
1. Remove the top cover.
2. Remove the front bezel by removing the 5 screws securing the front bezel to the bottom chassis.
3. Pull the internal module out of the platform assembly.
4. Installation is the reverse process with the flat edges on the gray portion of the internal module aligned so it will fit into the recessed area of the front panel and the black dot in the gray plastic to the bottom right.

Power Supply Removal

1. Remove the top cover.
2. Remove the front bezel by removing the 5 screws securing the front bezel to the bottom chassis.
3. Remove the air duct strap and air duct.
4. Remove the 5 wires from the PCBA auxiliary board (part no. A4-10670).
5. Remove the 7 wires from the power supply.

   NOTE: Pull or pry the wires straight up. Rocking the wire to remove it from the power supply may damage the terminal's solder joint on the power supply board.

Pull or pry wire terminal straight up.
Do not rock to remove.



Use bent tip needle nose pliers to pry the terminal off. The handle of a screwdriver is used as the fulcrum.

6. Remove the 4 screws from the power supply and pull the supply out of the front to remove.

7. Installation is the reverse process with the wires located as follows:

   - P1 on power supply to J5 on PCBA (part no. A4-10670) - red wire
   - P2A - Used to configure to 230v operation only - NOT USED
   - P2 on power supply to J4 on PCBA (part no. A4-10670) - brown wire
   - P3 on power supply to J1 on PCBA (part no. A4-10670) - blue wire
   - P4 on power supply - black wire from red/black pair - housed in tubing
   - P5 on power supply - red wire from red/black pair - housed in tubing
   - P11 on power supply - red or white wire from red/black pair (thin wire pair)
   - P12 on power supply - black wire from red/black pair (thin wire pair)

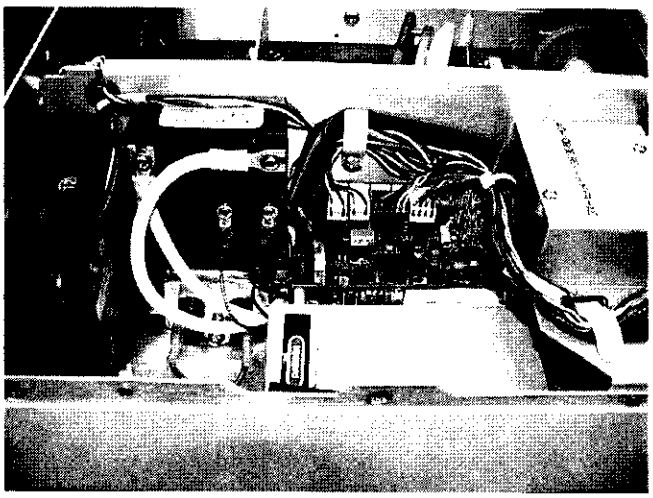
PCBA (PART NO. A4-10670) REMOVAL

1. Remove power as noted above.

2. Not the location and remove connectors from J6, J7, J9, J10, J11, and J12.

3. Using a short #1 screwdriver, remove the 4 screws from the corners of PCBA (part no. A4-10670) and remove PCBA.

4. Installation is the reverse process. Use the block diagrams as necessary to reconnect the wires. See figure below for proper wire routing.



IGNITOR REMOVAL

1. Remove the top cover.

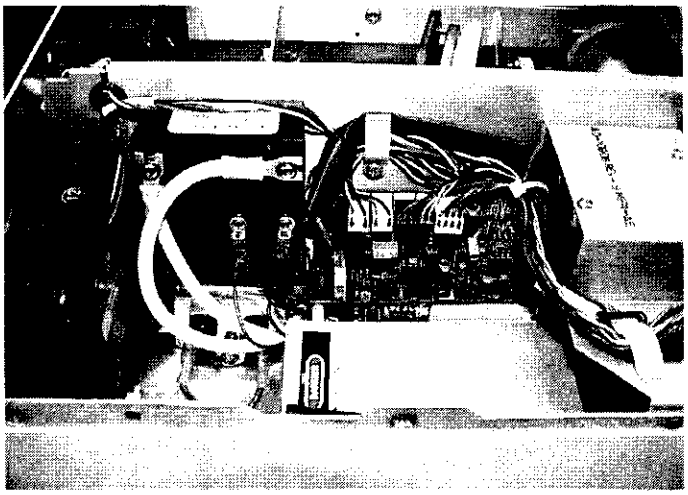
2. Disconnect the 2 lamp cable wires and the red and black wires from the ignitor. Note the wire locations.

3. Remove 4 screws, securing ignitor module to the center baffle. Screws are located on the other side of the center baffle.

4. Installation is the reverse process. NOTE: because the screwdriver will not directly reach the lower screws, installing and removing the screws into the ignitor to tap the holes prior to installing the ignitor in the unit will make the task easier.

5. Reconnect the wires as follows (see figure for orientation).

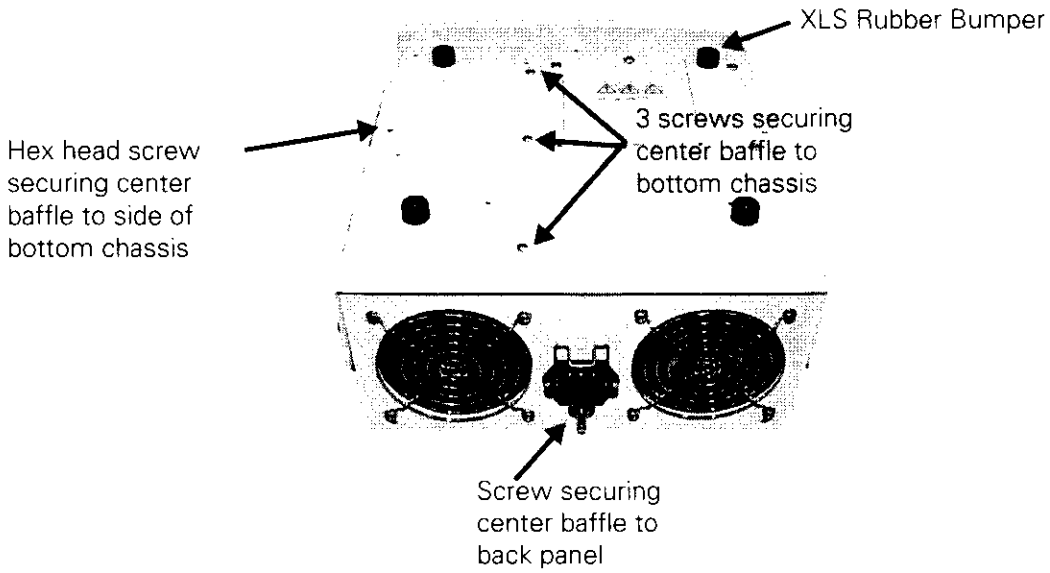
   - Red wire to the lower center most terminal.
   - Black wire to the lower outermost terminal.
   - - lamp cable wire to the top left terminal (shorter wire).
   - + lamp cable wire to the top right terminal (longer wire).



LINE FILTER REMOVAL

1. Remove the top cover.

2. Remove the screws securing the center baffle to the back panel and the bottom chassis (see figure below).



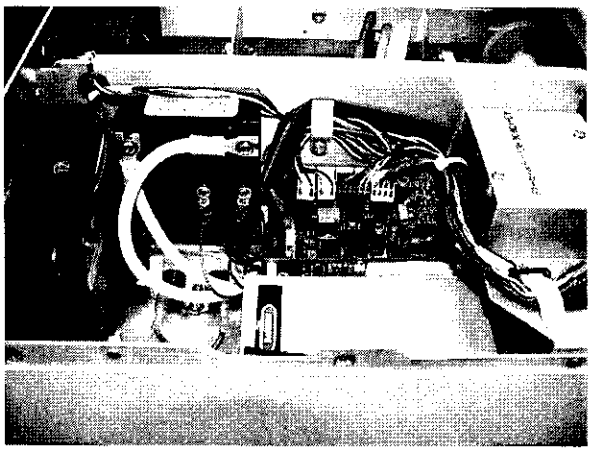
3. Remove the wires from both ends of the line filter. Note location of wires.
4. Remove the 2 screws securing the line filter and remove.
5. Installation is the reverse process with the following requirements:
   - The end of the filter with 3 terminals is on the platform side of the center baffle.
   - The green (ground) wire goes to the terminal directly mounted to the metal surface.
   - The blue wires go to the terminals nearest the fans on both ends. The brown wires go to the center most terminals.

CHASSIS FAN REMOVAL

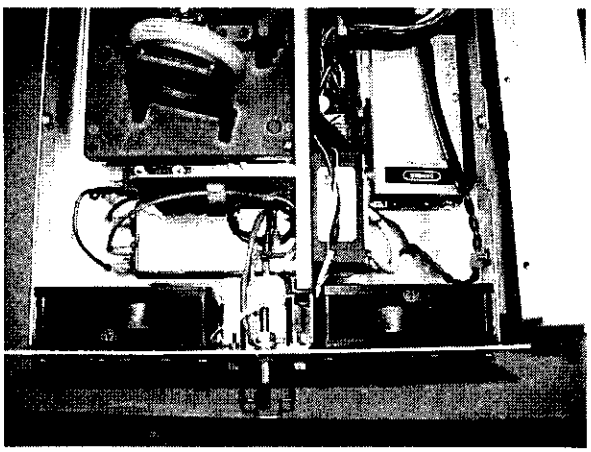
1. Remove the top cover.
2. Remove the 4 screws securing the fan and the wire guard. NOTE: to remove the fan from the lamp side of the unit, remove the fan on the power supply side. To remove the lamp fan, push the split grommet through the center baffle, then pull the wires out of the grommet.
3. Disconnect the fan connector from the PCBA Auxiliary board (part no. A4-10670) and remove.

4. Installation is the reverse process with J11 for the fan on the lamp side and J10 for the fan on the power supply side. Route the wires as shown in figures below.

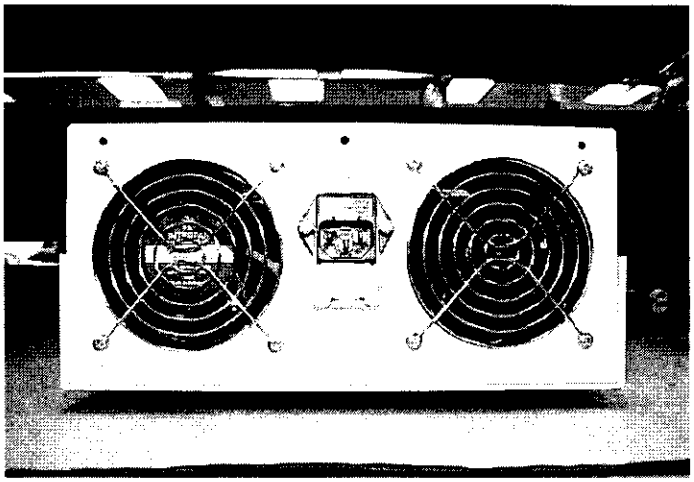
Wire Routing on Ignitor and PCBA
(part no. A4-10670)



Chassis Fan Wire Routing



The label on the lamp side fan faces out, the label on the power supply side faces in (see figure below).



POWER ENTRY MODULE REMOVAL

1. Remove the top cover.
2. Remove the 3 screws securing the back panel to the bottom chassis and the 1 screw back panel to center baffle.
3. Remove the 3 wire terminals from power entry module.
4. Move back panel as necessary to gain access to nuts securing the PEM (power entry module).
5. Remove nuts from the PEM and remove module.

6. Installation is the reverse process with the following requirements.

   - The lock washer is inserted between the PEM and the painted side of the back panel.
   - The flat washer is inserted between the non-painted side of the back panel and the nut.
   - The green (ground) wire is connected to the terminal soldered directly to the metal surface. The blue wire is connected to the terminal labeled N and the brown wire to the terminal marked P.

PLATFORM REMOVAL

1. Remove the top cover and remove the lamp.
2. Remove the front bezel by removing the 5 screws that secure it to the bottom chassis. Remove the internal module.
3. Remove the two screws from the air duct strap and remove the duct.
4. Remove the 4 screws securing the platform.
5. Remove the lamp shroud from the platform.
6. Remove the platform and the thermistor assembly from J12.
7. Installation is the reverse process. When installing the platform, verify that the shroud duct, the strap, and the internal module are installed. Reattach the front bezel and check for attenuator wheel alignment.

   - Rotate the wheel across its adjustment range and if the wheel moves freely, continue, if it does not move freely, loosen the platform screws and reposition the platform so the wheel rotates freely.

FRONT BEZEL REMOVAL

1. Remove the top cover.
2. Remove the 5 screws, securing the front bezel to the bottom chassis.
3. Noting the wire locations, remove the wires from the power switch. Push out the power switch.
4. Using a sharp knife, remove the black RTV from the LED. Once removed, apply acetone to the area between the LED and the front panel to loosen the glue bond. Remove the LED.
5. Installation is the reverse process with the LED glued to the front panel using Loctite 430 or equivalent. Once set, apply opaque sealant, Dow Corning 737 or equivalent, to the area around the LED to prevent light from the illuminator passing through the LED.

BLOWER FAN REMOVAL

1. Remove the top cover.
2. Remove the front bezel as described previously.
3. Remove the air duct strap and duct as described above.

4. Remove electrical connector J9 from PCBA (part no. A4-10670).

5. Remove the 2 nuts, screws, and spacers that mount the blower fan to the blower bracket.

6. Installation is the reverse process with the following requirements:

   - Spacers are installed on the screws between the bracket and the fan.

LAMP CABLE REMOVAL

1. Remove the top cover.

2. Open the lamp access door, open the latch, and disconnect cable.

3. Disconnect the lamp cable wires from the ignitor.

4. Pull lamp cable out through the lamp access door.

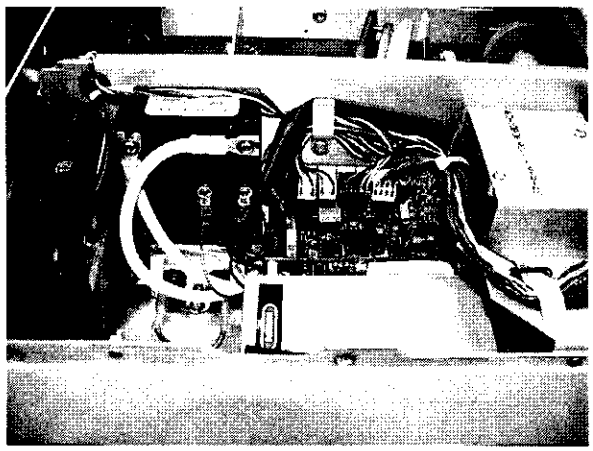
5. Installation is the reverse process with the following requirements.

   - Remove the nylon wire tie from the lamp cable.

   - Feed the wires through the space between the line filter and the center chassis.

   - Connect the shorter wire to the top left terminal on the ignitor. Connect the longer wire to the top, right terminal. Install the terminals between the two flat washers (see figure for wire routing).

Wire Routing on Ignitor and PCBA
(part no. A4-10670)



Welch Allyn®

CL 300 Surgical Illuminator Repair Parts List

Part Number	Description	Photo #	Bubble #	Quantity
90125	27W REPLACEMENT LAMP			1
LB-MAN-100W270W	MANUAL, 100W/270W SOLARTEC			1
RM-LBL-023	LABEL, PROTECTIVE EARTH GROUND			1
A0-10755	BEZEL 270	1	1	1
A0-10880	TOP COVER, LENGTHENED	1	2	1
A0-10797	EXTERNAL MODULE HOLDER, 270W	1	3	1
A0-10714	SCREW, PAINTED, XLS	1	4	18
A0-10768	LABEL, WARNING, ILLUMINATORS	2	5	1
101-0033	SCREW, #8-32 X 3/8, PHPS	2	6	4
101-0022	SCREW, #6-32 X 1/4, PHSS	2	7	8
A0-10907	CHASSIS BASE	2	8	1
101-0068	SEMS, #6-32 X 5/16, PHPS	2	9	8
016-0005	XLS, BUMPER, RUBBER, 5/8	2	10	4
101-0062	SEMS, #6-32 X 9/16 PHPS	2	11	8
207-0007	GUARD, FAN, 92MM	2	12	2
105-0008	CORD, RETAINING CLAMP	2	13	1
208-0016	FUSE, 5A SHEET III	1	14	2
A0-10904	BACK PANEL	2	15	1
213-0019	ROCKER SWITCH, ON/OFF, WHITE	3	16	1
A0-10906	BLOWER BRACKET	3	17	1
A0-10905	CENTER BAFFLE	3	18	1
A4-10670	PCBA, AUXILIARY	3	19	1
218-0003	IGNITOR, 270 WPI	3	20	1
A0-10864	CABLE, LAMP, 30K	3	21	1
105-0010	TENSION WIRE RETAINER	3	22	4
101-0078	SCREW, 4-40 X 1/4, FHD, SLT 82DG	3	23	1
A4-10680	WIRE HARNESS, LED/AUX/PS	3	24	1
112-0001	CABLE TIE, SMALL 4"	3	25	1
A0-10812	DUCT, NOZZLE BLOWER, 270W	4	26	1
A0-10814	STRAP, AIR DUCT	4	27	1
U50117	270W LAMP SHROUD SUB-ASSEMBLY	4	28	1
U50111	270W ADJUSTED POWER SUPPLY	4	29	1
213-0018	SWITCH, INTERLOCK, SNGL POLE	4	30	1
102-0012	KEPS, #6-32, W/CONICAL WASHER	4	31	3
210-0001	LINE FILTER, 6.0A, FLANGE	4	32	1

Part Number	Description	Photo #	Bubble #	Quantity
101-0059	SEMS, #6-32 X 1/4 PHPS	4	33	2
213-0017	POWER ENTRY MODULE / LINE FILTER, FUSED	4	34	1
101-0084	SCREW, #6 THD FRMG, PHPS	4	35	4
U50123	270W INTERNAL MODULE SUB-ASSMB	4	36	1
U50125	270W FILTER ASSEMBLY	5	37	1
101-0061	SCREW, #4-40 X 1/4, PHPS	5	38	2
U50115	2700W ALIGNED PLATFORM	5	39	1
101-0073	SCREW, #8-32 X 3/4", PHPS	5	40	4
A4-10655	FAN, BACK, 3 WIRE, 270W	6	41	2
A4-10672	WIRE HARNESS, FILTER/GROUND	6	42	1
A4-10673	WIRE HARNESS, SWITCH/FILTER	6	43	1
A4-10674	WIRE HARNESS, AC/FILTER	6	44	1
109-0006	BUSHING, OPENED/CLOSED, .500	6	45	1
A4-10675	WIRE HARNESS, AC/SWITCH	6	46	1
A4-10465	WIRE, PEM TO DIN	6	47	1
A4-10676	WIRE HARNESS, FILTER/PS	6	48	1
A4-10678	WIRE HARNESS, AUX/PS	7	49	1
A4-10677	WIRE HARNESS, ON/OFF/AUX	7	50	1
101-0085	SEMS, 4-40 X 3/8, PHPS	7	51	4
A4-10683	FAN, BLOWER, TEFLON WIRE	7	52	1
101-0083	SCREW, 4-40 X 1 1/4",PHPS, SS	7	53	2
106-0015	SPACER, #4 UNTHRD, 1/4 od, 1/4l	7	54	2
102-0008	NUT, KEP, 4-40, HEX	7	55	2
106-0011	STANDOFF, #8, .75L	7	56	4
102-0001	NUT, HEX	8	57	1
104-0007	WASHER, FLAT	8	58	1
104-0008	WASHER, SERRATED	8	59	1
104-0019	WASHER, #4 EXTERNAL TOOTH	8	60	2
101-0038	PLUG, 6/25	8	61	1
104-0006	WASHER, COLOR COATED	8	62	1

PHOTO 1

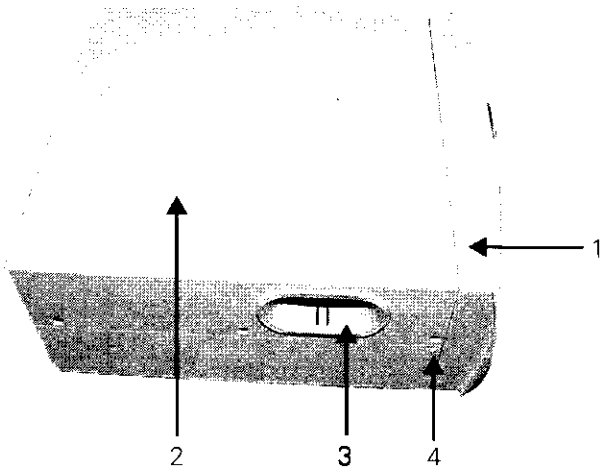


PHOTO 2

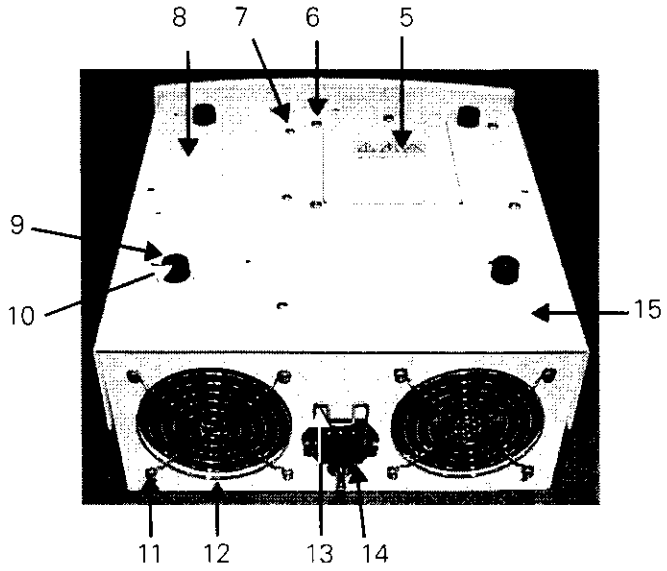


PHOTO 3

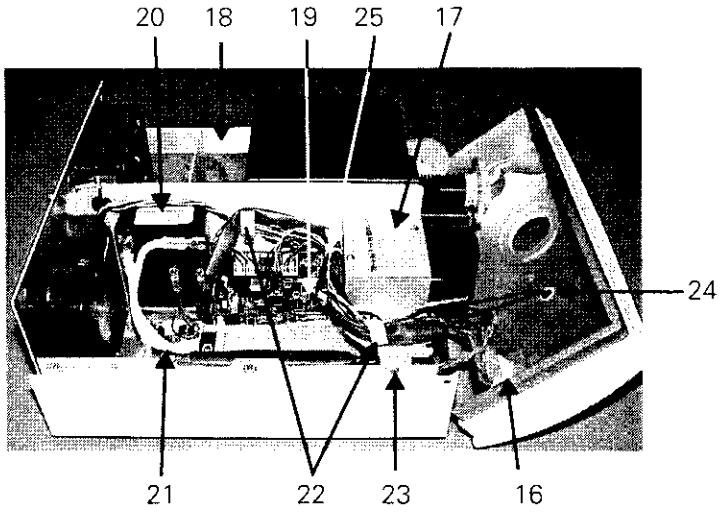


PHOTO 4

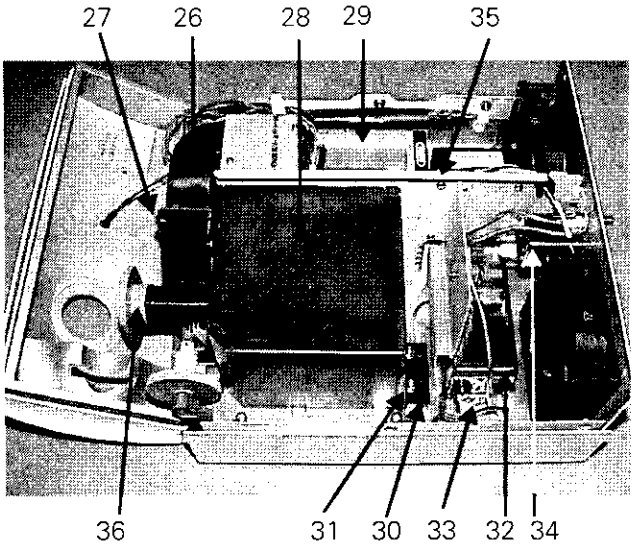


PHOTO 5

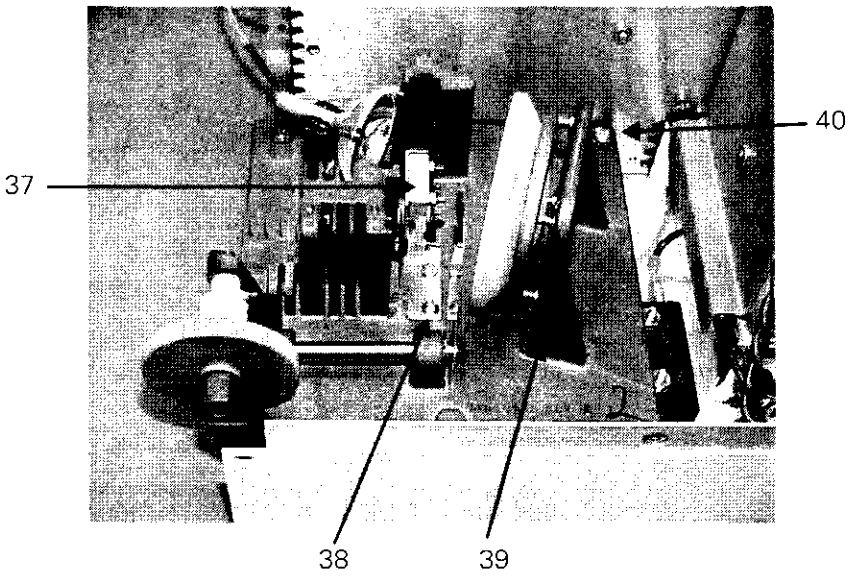


PHOTO 6

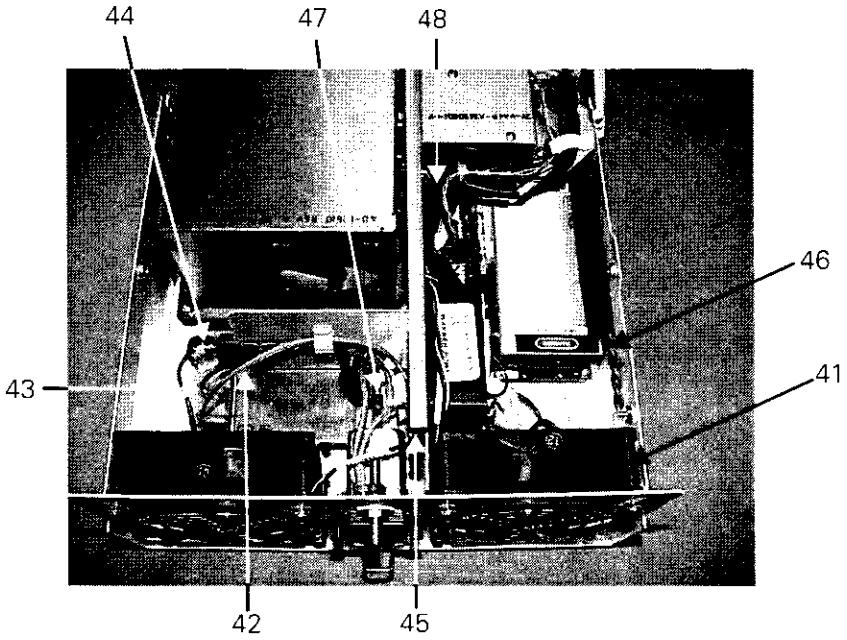


PHOTO 7

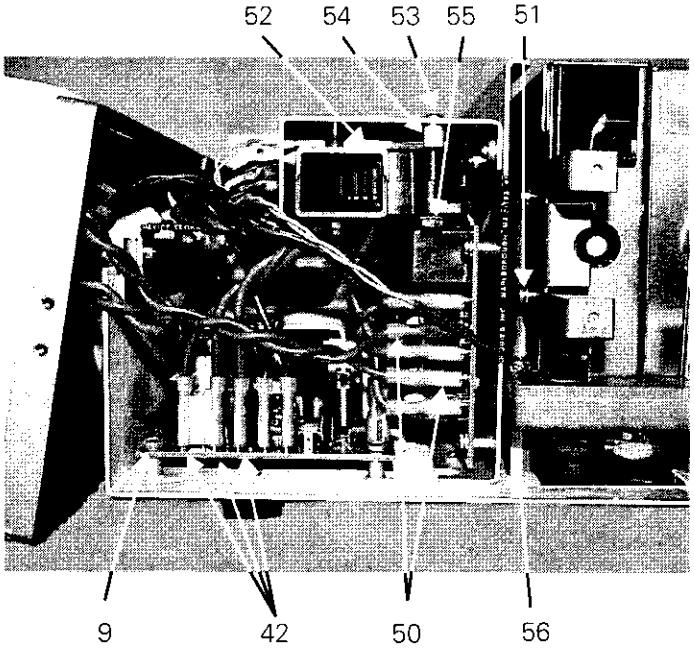
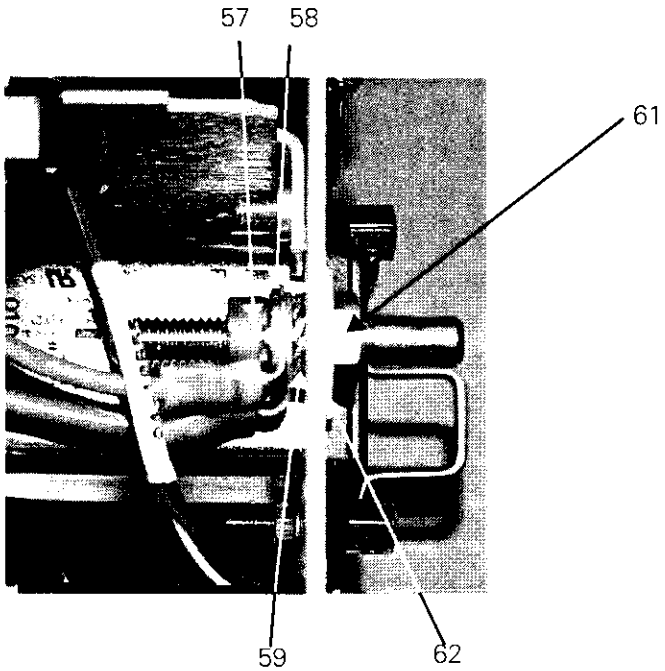


PHOTO 8



GLOSSARY OF TERMS

AC	Alternating Current
COM	Found on power connectors, switches, etc... indicating Common wire termination
DMM	Digital Multi Meter
Fiber Optic Bundle	Any of a number of light transmission devices characterized by use of multiple, hair thin strands of cladded glass fibers. Used to deliver light from illuminator box to work area.
Leakage Current	Usually a specified maximum amount of allowable current to pass through isolated electrical components when subjected to very high electrical potentials.
LED	Light Emitting Diode
Metal Halide	Any of a number of metallic compounds, usually iodides that are used in trace amounts in discharge light sources. Metal halides are incorporated to produce the desired spectral content of the light source.
NO	Normally Open, Found on switches indicating normally open termination.
PC Board	Printed Circuit Board
PEM	Power Entry Module
RTV	Room Temperature Vulcanizing Silicone
TRMS	True Root Mean Squared - used to characterize accuracy of digital multi-meters.
VDC	Voltage -Direct Current
Xenon	An elemental gas used commonly used in lighting products. Used as an evaporant suppressant in tungsten halogen lamps or light emission in gaseous discharge lamps.

FINAL INSPECTION

The purpose of preventative maintenance is to pro-actively reduce or eliminate future problems. Keeping the light source in good operating condition ensures that it will perform reliably and safely. Every six to twelve months, you should:

NOTE: Perform hypot and ground continuity tests on the unit before beginning the final inspection.

CL 100 SURGICAL ILLUMINATOR

1. Set TIME to start. Turn on the SYSTEM. Begin the fifteen (15) minute BURN-IN period. Check for the following:
   - Did the yellow LED light briefly?
   - Did the lamp start? Clicking before the lamp ignites is normal (10 clicks or less).
   - Are the fans running?
2. After the fifteen (15) minute burn-in insert the POWER TEST FIBER into the Port. Open the attenuator fully and measure the light output. Rotate the proximal end to maximize power output and check the following:
   - Does the connector insert smoothly?
   - Does the attenuator move smoothly?
   - Does the Light Output measure $\geq$ 750 milliwatts? Light output $\leq$ 375 is considered the end of the life of the lamp.
   - Turn the system off and on again 3 more times. Does it light abruptly and properly?

If testing has PASSED, continue. If unit fails testing, troubleshoot as necessary.

CL 300 SURGICAL ILLUMINATOR

IMPORTANT: Clicking before the LAMP ignites is normal (10 clicks or less). Do not hot re-strike in succession. The ILLUMINATOR must remain illuminated for a minimum of forty-five (45) seconds each time before turning off. Wait thirty (30) seconds between each re-strike.

Turn the ILLUMINATOR off and on again three (3) more times. The ILLUMINATOR must remain illuminated for a minimum of forty-five (45) seconds each time before turning off. Using a TIMER, wait thirty (30) seconds between re-strikes. Clicking before the LAMP ignites is normal (10 clicks or less). Does it light promptly and properly?

If testing has PASSED, continue. If unit fails testing, troubleshoot as necessary.

1. Set TIME to start. Turn on ILLUMINATOR. Begin the fifteen (15) minute BURN-IN period. Check for the following:
   - Did the yellow LED light briefly?
   - Did the lamp start? Clicking before the lamp ignites is normal (10 clicks or less).
   - Are the fans running?

2. After the fifteen (15) minute burn-in insert the POWER TEST FIBER into the Port. Open the attenuator fully and measure the light output. Rotate the proximal end to maximize power output and check the following:

   - Does the connector insert smoothly?
   - Does the attenuator move smoothly?
   - Does the Light Output measure $\geq$ 361 lumens? Light output $\leq$ 200 is considered the end of the life of the lamp.

SPECIFICATIONS

Physical

Size / Weight (CL 100)	5.5" H x 11.25" W x 11.25" D/9.0lb (140mmH x 286mmW x 286mmD/4.0kg)
Size / Weight (CL 300)	5.5" H x 11.25" W x 12.75" D/11.1lb (140mmH x 286mmW x 324mmD/5.0kg)
Space Requirements	Minimum 2" (51mm) airspace around top, back and sides
Finish	Painted surfaces - polyurethane

Lamp

Lamp Type	100W Xenon Arc 270W Short Arc DC Metal Halide

Power Requirements

Electrical	100-240 VAC 50/60Hz
Amperage	2.5 Amps @ 120V (Surgical Illuminator CL 100) 4 Amps @ 120V (Surgical Illuminator CL 300)

Safety Compliance

78737

UL2601-1 2nd ed, CSA/CAN-C22.2 No. 601-1-M90,

IEC601-1:1988/EN 60601-1:1990 Amend. 2,

IEC601-1-2:1993/EN 60601-1-2:1993 (Class B), JIS T 1001:1992,

IEC601-2-18:1996/EN 60601-2-18:1996

IEC Classification

Type BF, Class I

Continuous Operation IPX0

CE The CE mark on this product indicates that it has been tested to and conforms with the provisions noted within the 93/42/EEC Medical Device Directive and 89/336EEC EMC directive.

EU Contact:

European Regulatory Manager
Welch Allyn Ltd.
County Meath, Republic of Ireland
Tel 353 46 67700
Fax 353 46 27128

THEORY OF OPERATION

LIGHT SOURCE

The Light Sources consist of an enclosure housing, a high intensity lamp, proprietary optical platform, user controls and indicators, and a power supply with control electronics. Cooling is provided via internal fans. In the event that the fan(s) malfunctions or if adequate air flow is blocked and/or the internal temperature of the device exceeds the engineering specifications, an internal thermal protection mechanism will automatically shut off power to the lamp. After cooling, restart the Light Sources.

REPLACEMENT LAMPS

The lamps are high pressure, high intensity and long life Light Sources. They are mounted into a patented lamp fixture which is designed to allow both easy and rapid exchange in the field as well as ensuring precise alignment to the optical platform.

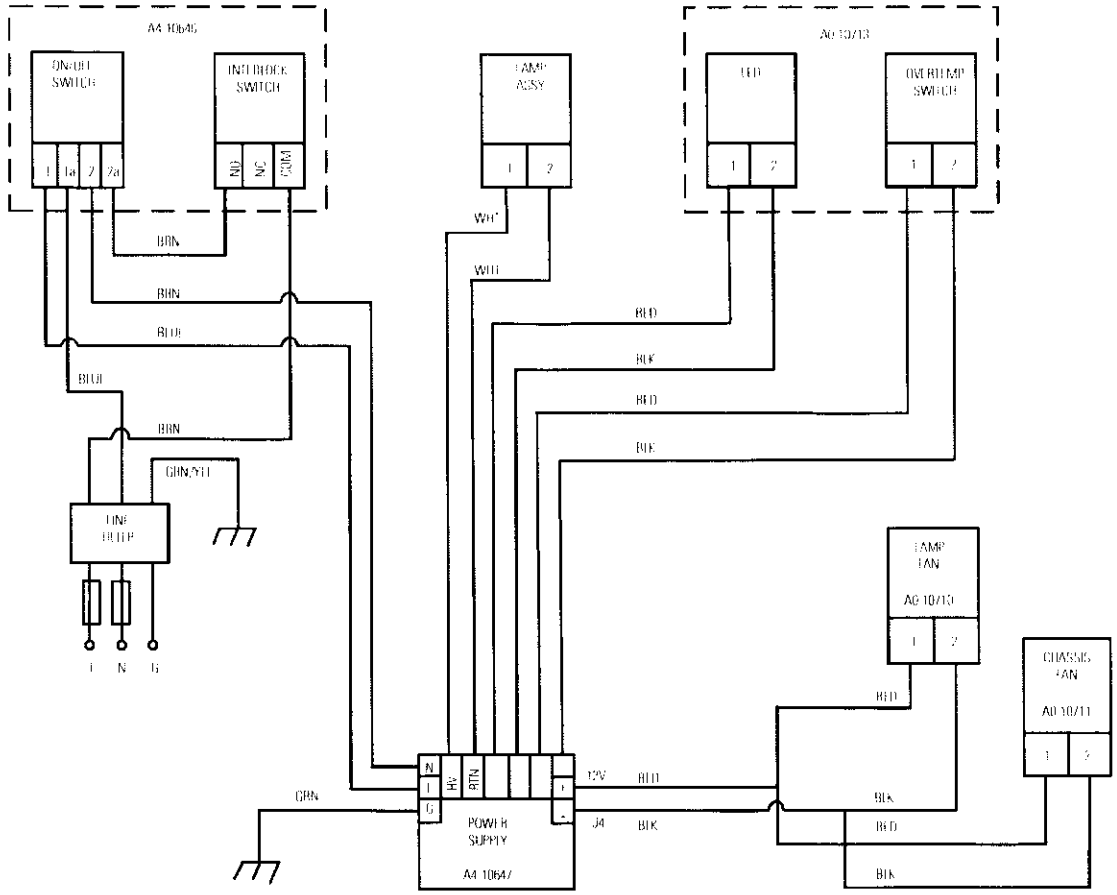
POWER SUPPLY WITH CONTROL ELECTRONICS

All the electricity to the Light Source is controlled through the ON/OFF switch. Power to energize and operate the lamp, fans, and control circuitry is provided by a custom designed, wattage regulated, switching power supply. The operational life of the lamp and the lamp life indicator are controlled by a lamp voltage monitoring circuit.

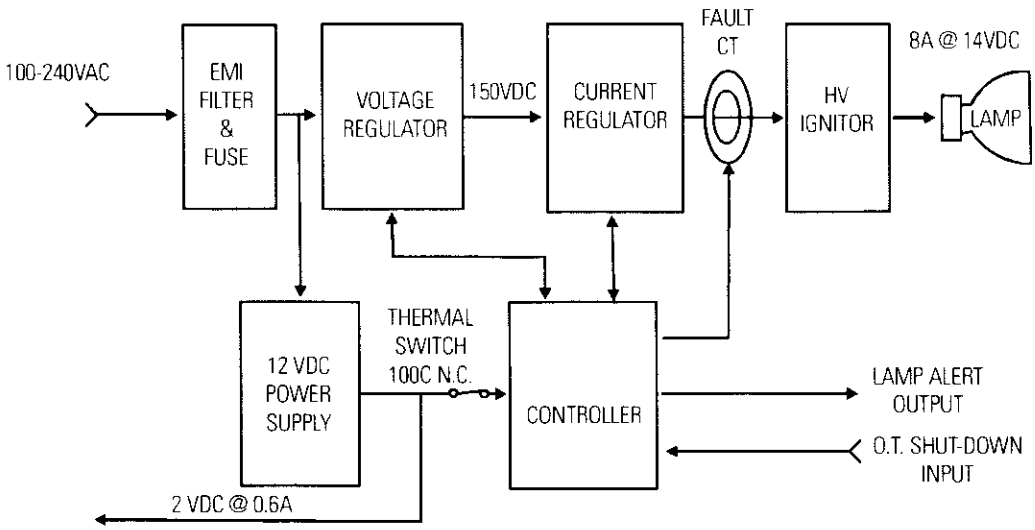
MULTI LINK™ PORT AND MULTI LINK™ EXPANSION PORT

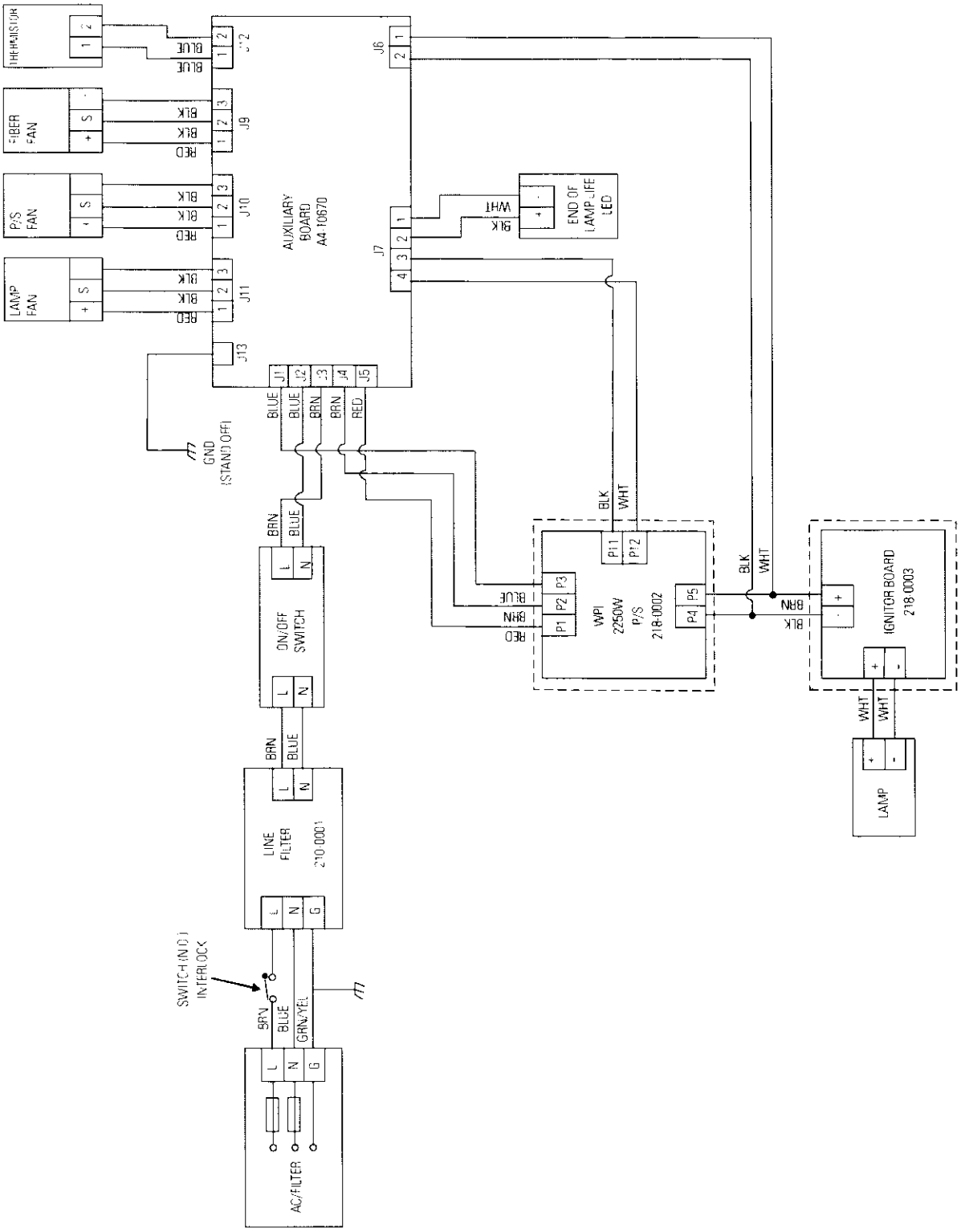
Internal, to both the multi Link™ Port and Multi Link™ Expansion Port, are patented coupling optics and mechanics designed to produce the highest output powers. Internal to the Light Sources are fans and heatsinks designed to reduce temperatures at the optical coupling joints thereby minimizing the possibility of damage to Micro Link® Fiber and fiber bundles.

CL 100 Surgical Illuminator Circuit Diagram



POWER SUPPLY BLOCK DIAGRAM



Welch Allyn®

CL 300 Surgical Illuminator Circuit Diagram